

Immunization with *Streptococcus bovis* protects against lactic acidosis in sheep

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Abstract

Lactic acidosis is a gastrointestinal disorder resulting from the rapid overgrowth of lactic acid-producing bacteria when ruminants are suddenly introduced to grain feed. The present study has investigated the ability of live and killed bacterial vaccines to reduce lactic acidosis in sheep, via a stimulation of specific antibody production against lactic acid-producing bacteria. Forage-fed sheep were immunized with live or killed *Streptococcus bovis* Sb-5 vaccine, with or without adjuvant, via intramuscular injection. After the primary immunization, three boosters were given at 2–4 week intervals. Sheep were subsequently challenged by a sudden switch to a grain-based diet. Following challenge, vaccinated sheep maintained significantly higher feed intake, and had higher rumen pH, lower L-lactate concentrations, and less severe diarrhoea scores than non-vaccinated control sheep. Higher rumen pH, lower mortality and less severe diarrhoea were found in the animals immunized with live vaccine compared to the animals immunized with killed vaccines. Significant increases in mucosal and systemic antibody responses were observed after boosting; the *S. bovis*-specific antibody concentrations were significantly higher in samples of saliva, rumen fluid and serum from sheep immunized with live vaccine than with killed vaccines. These results demonstrate that lactic acidosis can be reduced by immunization against *S. bovis*, and that live Sb-5 vaccine is effective in invoking mucosal as well as systemic antibody responses.

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